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Mr. James Saric
Remedial Project Manager
USEPA Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, IL 60605-3507

SEDIMENTS

Subject:
Kalamazoo River Off-Channel Areas Work Plan

Date:
October 7, 2009

Contact:
Michael J. Erickson

Phone:
810.225.1924

Email:
michael.erickson@arcadis-us.com

Our ref:
B0064539.500

Dear Mr. Saric:

At the April 27, 2009 meeting between the Kalamazoo River Study Group (KRSG), the United States Environmental Protection Agency (USEPA), and the Michigan Department of Environmental Quality (MDEQ) in Detroit, Michigan, all parties agreed to review the representativeness of existing sediment data for side channel and off-channel areas upstream of the Plainwell No. 2 Dam Area. KRSG provided a summary of the existing sediment data from off-channel areas between Crown Vantage and the Plainwell No. 2 Dam Area to USEPA on June 11, 2009; and subsequently USEPA requested additional characterization of the off-channel area sediments. On August 13, 2009, KRSG provided a proposed approach to USEPA to collect additional sediment data representative of off-channel areas. MDEQ provided input on the proposed approach in the form of an alternative proposal on September 18, 2009. Based on this input, KRSG developed a revised sampling approach targeting the four off-channel sediment areas between Crown Vantage and the Plainwell No. 2 Dam Area, as proposed by MDEQ. KRSG discussed this revised approach on a call with USEPA and MDEQ on October 1, 2009 and it was agreed to also include additional steps to estimate the frequency of occurrence and area extent of fine sediment deposits in the four targeted off-channel areas (areas 1, 5, 10, and 14; see Figure 1). The sampling approach incorporating agreements resulting from these prior collaborative discussions is presented in this letter for USEPA approval.

Purpose and Objectives

The purpose of the off-channel area sampling is to assess off-channel sediments with respect to distribution of polychlorinated biphenyls (PCB) concentrations as compared to main-channel sediments, and to determine the relative influence of these off-channel areas on Area 1 PCB exposure concentrations and PCB mass inventory estimates. The objective of this sampling plan is to collect samples

representative of PCB concentrations in fine and coarse sediments across the extent of these off-channel areas, and to provide information on the relative occurrence of fine and coarse sediments in such areas.

Off-Channel Areas Sampling Approach

Sampling transects will be established at the regularly-spaced locations along each area shown in Figures 1-4. At each proposed location identified on Figures 1-4, a transect will be established approximately perpendicular to the shoreline. Sediments will be probed with a steel rod at 3 to 5 evenly-spaced locations (including edge of water and mid-channel) across each transect. The probed locations will be surveyed (horizontal coordinates and vertical elevation) of top of sediment), the water depth and sediment thickness will be measured, and the sediment composition described. Probing locations will be field-selected for sediment core sampling based on observations of sediment type, sediment thickness, and transect bathymetry/local morphology with a goal of obtaining approximately 75 percent of sediment samples from fine sediments and 25 percent from coarse samples in each off-channel area, unless only fine sediments are present. In order to provide appropriate spatial coverage, a sediment sample from fine materials may be selected from every other transect first, then the remaining transects will be sampled to fill in the 25 percent coarse or remaining fine materials. The appropriateness of this sequence versus a simple progression from one end of the transect to the other will be determined in the field. The proposed number of samples for each targeted area is summarized in Table 1.

In addition to the sediment probing and sample collection described above, probing transects will also be established approximately midway between the core sample collection transects (note, for simplicity these mid-point transects are not shown on Figures 1 through 4). All activities described above will be completed along these probing transects, with the exception of sediment core collection. Additionally, the geographical distribution of fine sediments along each off-channel area will be noted between transects based on visual inspection to facilitate understanding the approximate size and continuity of fine sediment deposits.

Core Collection and Analysis

Once locations for core sampling are selected along each sampling transect in the field, a core will be collected by hand-driving Lexan tubing into the sediment until

refusal, creating a vacuum, and retrieving the core. Each core will be photographed and described using the Unified Soil Classification System.

All core samples will be processed and analyzed in accordance with the methods and protocols described in the USEPA-approved Area 1 SRI/FS Work Plan (ARCADIS BBL 2007a) and Multi-Area Field Sampling Plan (ARCADIS BBL 2007b), as well as prior practice for sample handling and core sectioning for investigatory work completed pursuant to the *Kalamazoo River SRI Phase 2 Sediment Core Analyses Plan* (ARCADIS 2008). Core sectioning intervals will be varied as necessary to represent visually-distinct strata, where present. All samples will be submitted for PCB, total organic carbon, and particle size distribution analysis.

Schedule

In accordance with the scope of work, USEPA was notified via email on September 22, 2009 of our intention to complete sampling activities between October 19 and October 30, 2009. This schedule is contingent upon approval of this sampling plan by USEPA. Detailed daily or weekly work schedules will be established in coordination with USEPA's oversight contractor following approval of this sampling plan.

Sincerely,

ARCADIS

Michael J. Erickson, P.E.
Associate Vice President

Copies:
John Bing-Canar, USEPA FIELDS
Chuck Roth, USEPA FIELDS
Paul Bucholtz, MDEQ
Jeff Keiser, CH2M HILL
Todd Goeks, NOAA
Garry Griffith, P.E., Georgia-Pacific LLC
L. Chase Fortenberry, P.G., Georgia-Pacific LLC
Mark Brown, PhD, Waterviews, LLC
Martin Lebo, PhD, Weyerhaeuser NR Company

Enclosures:
Tables

Table 1 – Existing and Proposed Sample Locations in Targeted Off-Channel Areas

Figures

Figure 1 – Off-Channel Areas

Figure 2 – Proposed Off-Channel Area Sample Locations: Area 1

Figure 3 – Proposed Off-Channel Area Sample Locations: Area 5

Figure 4 – Proposed Off-Channel Area Sample Locations: Area 10

Figure 5 – Proposed Off-Channel Area Sample Locations: Area 14

References

ARCADIS BBL. 2007a. *Supplemental Remedial Investigation/Feasibility Study Work Plan – Morrow Dam to Plainwell.* February 2007.

ARCADIS BBL. 2007b. *Multi-Area Field Sampling Plan*. October 2007.

ARCADIS. 2008. *Kalamazoo River SRI Phase 2 Sediment Core Analyses Plan*. November 2008.

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Tables

Kalamazoo River Study Group
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
Supplemental Remedial Investigations/Feasibility Studies
Kalamazoo River Off-Channel Areas Work Plan

Table 1 - Existing and Proposed Sample Locations in Targeted Off-Channel Areas

Off-Channel Area	Area (acres)	Number of Existing Samples	Number of Proposed Additional Samples
1	1.08	0	7
5	3.08	0	7
10	3.21	2	8
14	unknown	0	7
Total	**7.37**	**2**	**29**

Notes:

1. Samples will be submitted for PCB, total organic carbon, and particle size distribution analysis.

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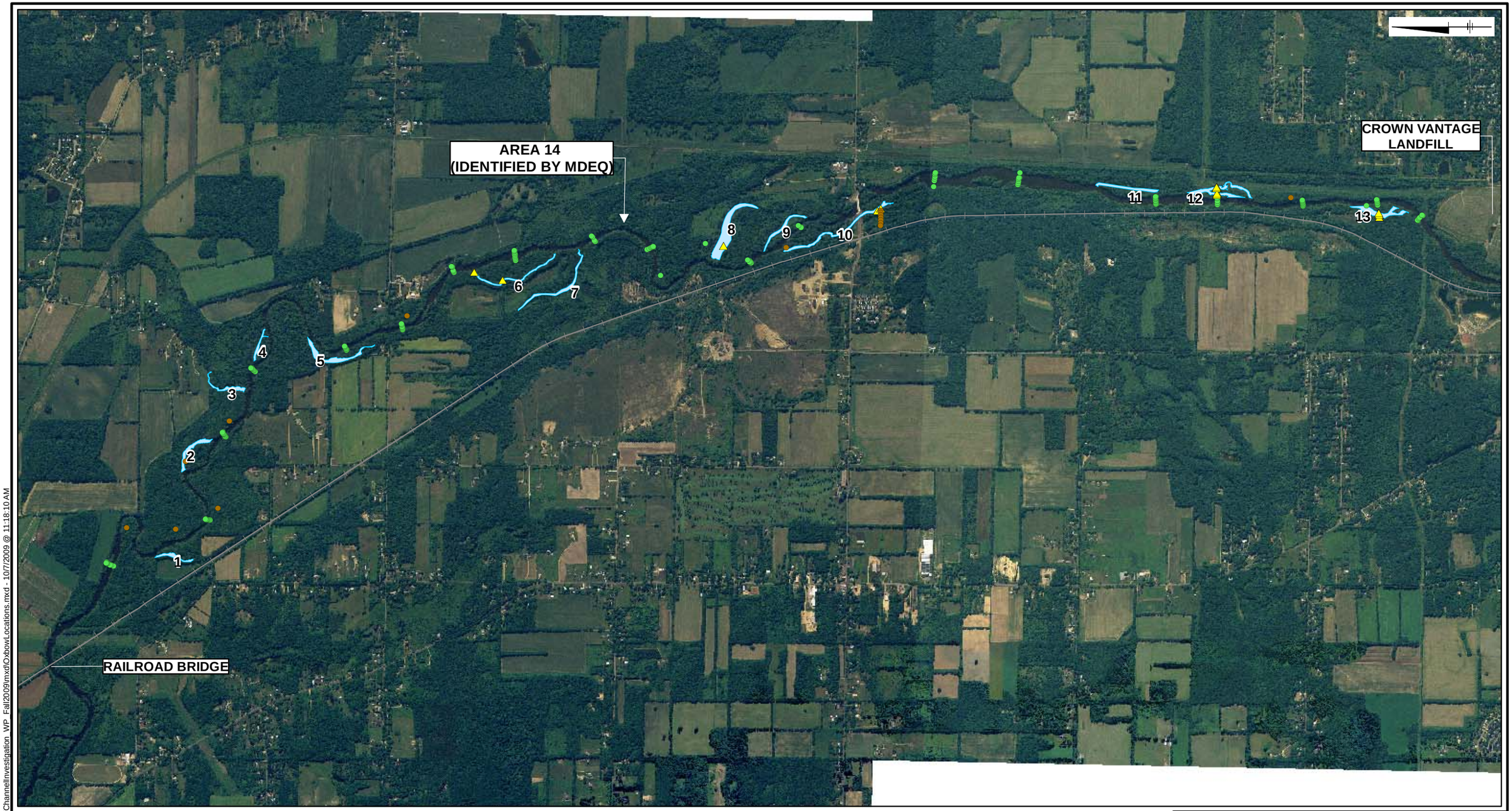
Figures



LEGEND:

- SOIL SAMPLE LOCATION
- SEDIMENT SAMPLE LOCATION
- OFF-CHANNEL SAMPLE LOCATION
- RAILROAD
- OFF-CHANNEL AREA

NOTES:

1. NAIP AERIAL IMAGERY FROM 2005.
2. SEDIMENT SAMPLES COLLECTED IN 1993 AND 2000. SOIL SAMPLES COLLECTED IN 2000.

0 2,200 4,400 Feet

GRAPHIC SCALE

KALAMAZOO RIVER STUDY GROUP
ALLIED PAPER, INC./PORTAGE CREEK/
KALAMAZOO RIVER SUPERFUND SITE
KALAMAZOO RIVER OFF-CHANNEL AREAS WORK PLAN

OFF-CHANNEL AREAS

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FIGURE
1

CITY: SYR DIV/GROUP: SYE40 DB: KEW JCR LD: PIC: PM: TM: TR:
KRSG (B0064585.0000.00022)
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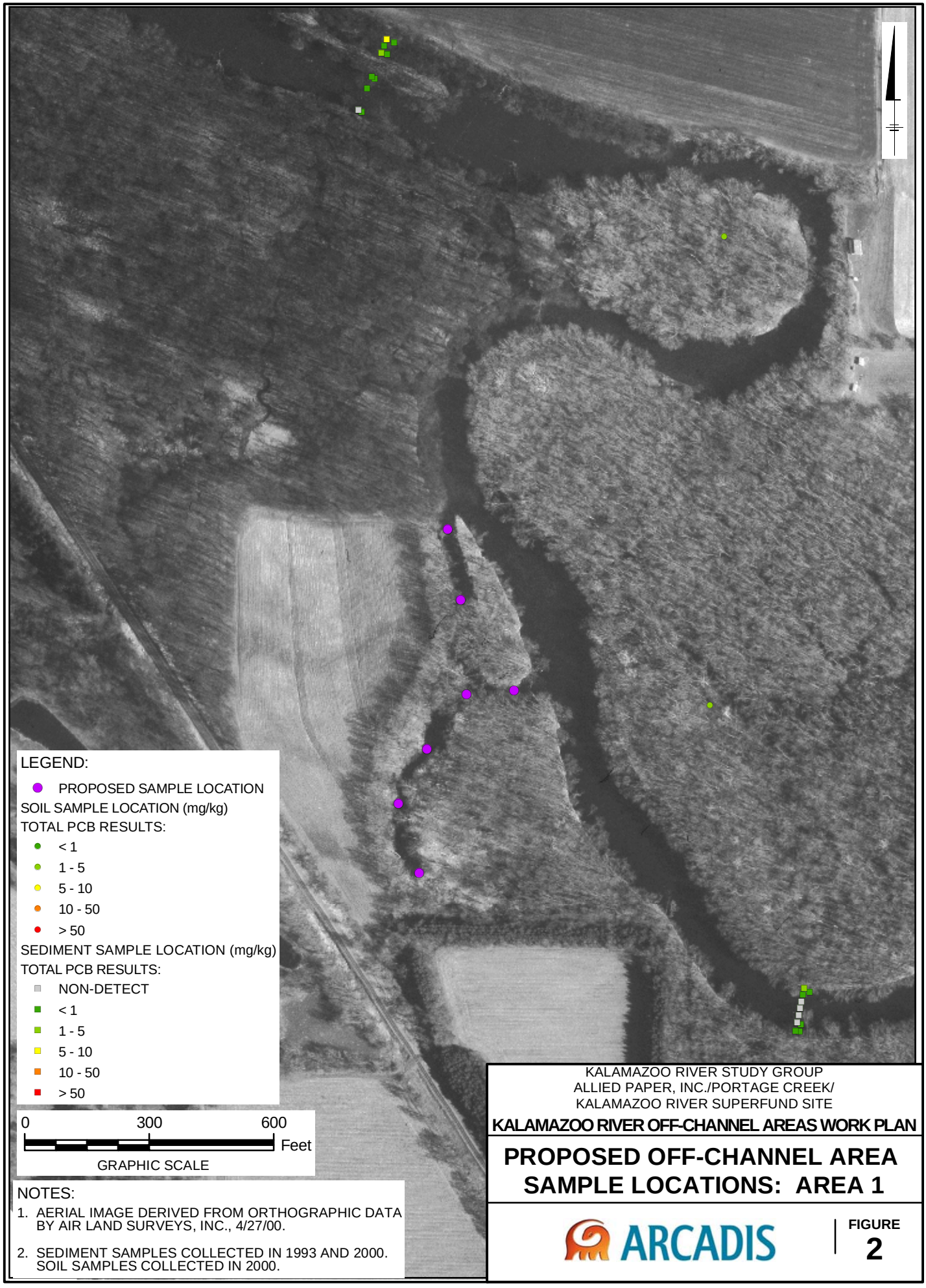

NOTES:

1. AERIAL IMAGE DERIVED FROM ORTHOGRAPHIC DATA BY AIR LAND SURVEYS, INC., 4/27/00.
2. SEDIMENT SAMPLES COLLECTED IN 1993 AND 2000. SOIL SAMPLES COLLECTED IN 2000.

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PROPOSED OFF-CHANNEL AREA SAMPLE LOCATIONS: AREA 1

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FIGURE 2

CITY: syr DIV/GROUP: ait DB: KEW JCR LD: PIC: PM: TM: TR:
KRSG (64539.500)
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NOTES:

1. AERIAL IMAGE DERIVED FROM ORTHOGRAPHIC DATA BY AIR LAND SURVEYS, INC., 4/27/00.
2. SEDIMENT SAMPLES COLLECTED IN 1993 AND 2000. SOIL SAMPLES COLLECTED IN 2000.

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PROPOSED OFF-CHANNEL AREA SAMPLE LOCATIONS: AREA 5

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FIGURE 3

CITY: SYR DIV/GROUP: AIT DB: KEW JCR LD: PIC: PM: TM: TR:
KRSG (64539.500)
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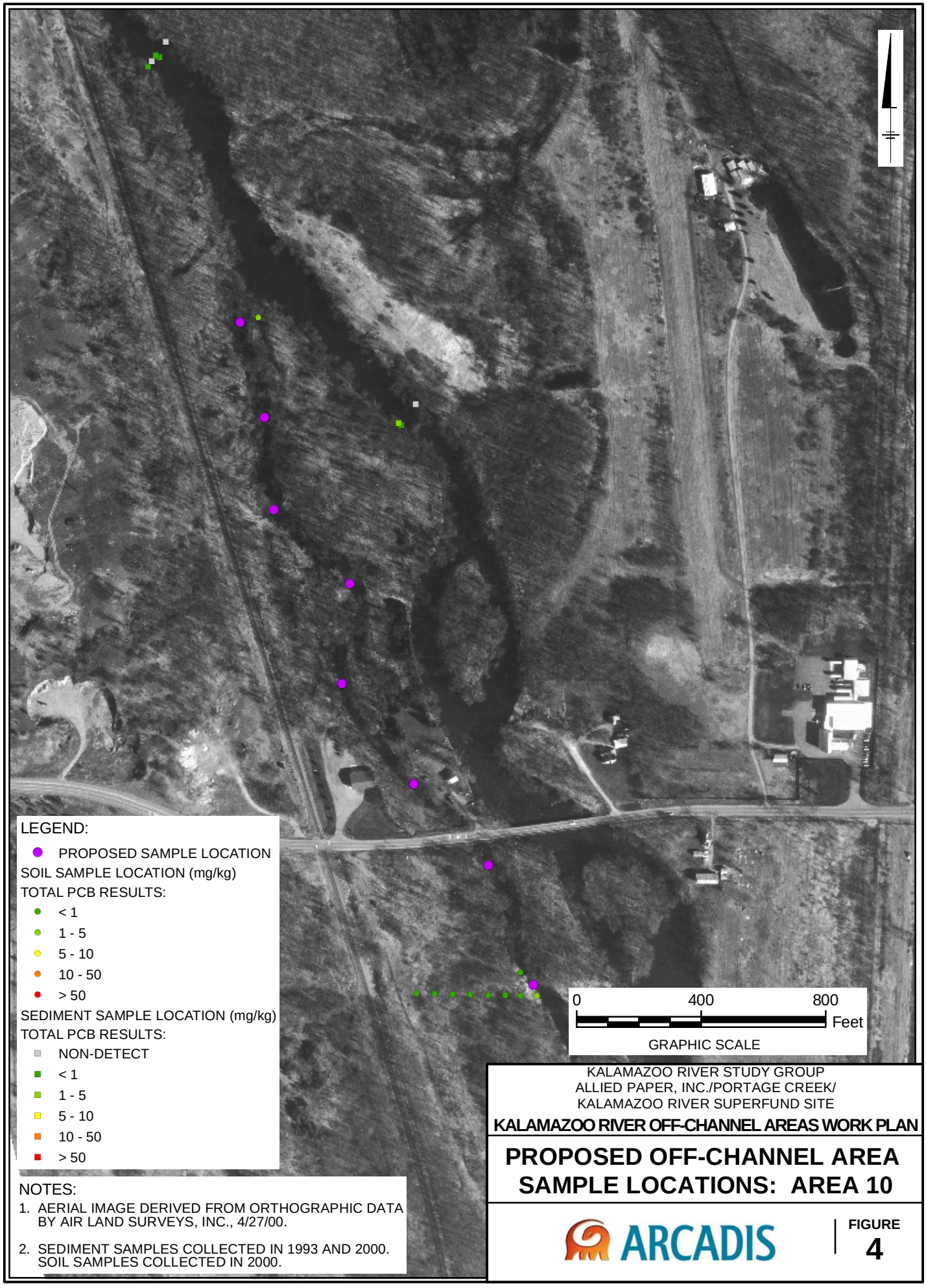

NOTES:

1. AERIAL IMAGE DERIVED FROM ORTHOGRAPHIC DATA BY AIR LAND SURVEYS, INC., 4/27/00.
2. SEDIMENT SAMPLES COLLECTED IN 1993 AND 2000. SOIL SAMPLES COLLECTED IN 2000.

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KALAMAZOO RIVER OFF-CHANNEL AREAS WORK PLAN

PROPOSED OFF-CHANNEL AREA SAMPLE LOCATIONS: AREA 10

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FIGURE 4

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
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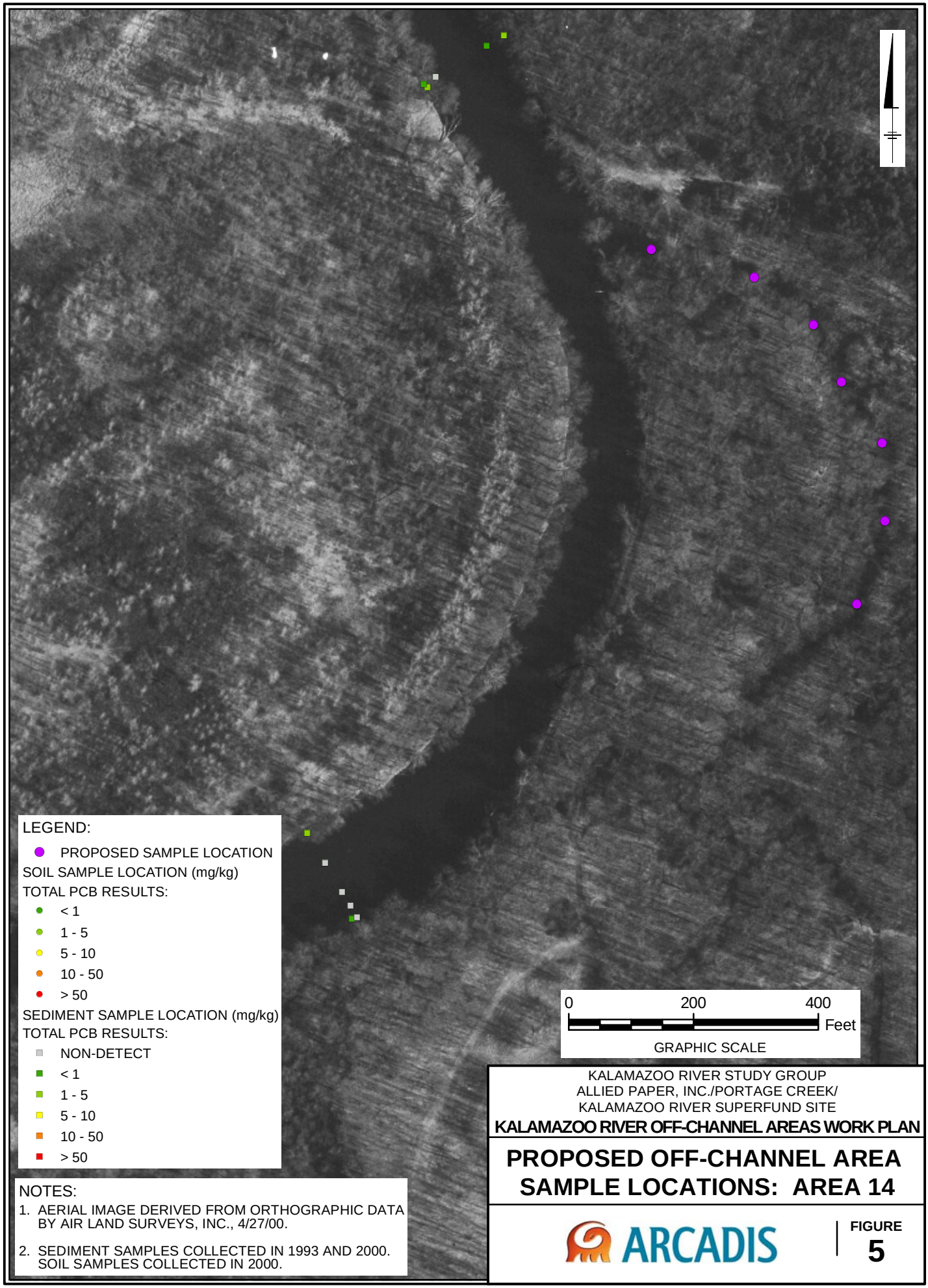

NOTES:

1. AERIAL IMAGE DERIVED FROM ORTHOGRAPHIC DATA BY AIR LAND SURVEYS, INC., 4/27/00.
2. SEDIMENT SAMPLES COLLECTED IN 1993 AND 2000. SOIL SAMPLES COLLECTED IN 2000.

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PROPOSED OFF-CHANNEL AREA SAMPLE LOCATIONS: AREA 14

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FIGURE 5

CITY: syr DIV/GROUP: ait DB: KEW JCR LD: PIC: PM: TM: TR:
KRSG (64539.500)
Q:\KRSG\MorrowDamToPlainwellDam\SRI_OffChannelInvestigation_WP_Fall2009\mxd\SPC2.mxd - 10/7/2009 @ 1:13:08 PM